

REMARKS

This responds to the Office Action mailed on July 26, 2005.

Independent claim 25 has been amended. No claims have been canceled or added. As a result, claims 4-27 and 29 remain pending in this application.

For the convenience of the Examiner, Applicants' remarks concerning the claims will be presented in the same order in which the Examiner presented them in the Office Action.

Amendments to the Specification

On page 6, Applicants have amended the paragraph beginning at line 16 by inserting "front or bottom surface" for "bottom surface".

On page 6, Applicants have amended the paragraph beginning at line 22 by inserting "back or upper surface" for "surface".

These amendments are made for the purpose of using consistent language in describing the two opposing surfaces of the die. Support for these amendments may be found, for example, in the original specification.

Regarding the first of the above two amendments, the surface of the die that is mounted on substrate 54 (FIG. 2) is referred to in the original specification as the "bottom" surface of the die (see page 6, line 17, for example). By inference, it may also be referred to as the "front" surface of the die, because the opposing surface of the die is referred to as the "back" surface.

Regarding the second of the two amendments, the surface of the die to which an integrated heat spreader (HIS) 52 (FIG. 2) is coupled is referred to elsewhere in the specification as the "back" surface of the die (see page 4, line 13, for example) or the "upper" surface of the die (see page 11, line 16, for example).

No new matter has been added by way of these amendments to the specification.

Amendments to Claim 25

Independent claim 25 has been amended by substituting “back surface” for “surface”; and by inserting “, the back surface being formed of silicon, silicon oxide, or silicon nitride”.

Support may be found, for example, at page 8, lines 15-16.

No new matter has been introduced.

Rejection of Claims 4-24 Under 35 U.S.C. §103(a) as Unpatentable over Kajiwara in view of Lam

Claims 4-24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kajiwara et al. (JP 63287038) in view of Lam (U.S. 5,249,728).

To establish a *prima facie* case of obviousness under 35 U.S.C. §103, the prior art reference (or references when combined) must teach or suggest every limitation of the claim. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA, 1974). MPEP §2143.

Regarding independent claim 4, the Examiner’s asserted combination of Kajiwara and Lam fails to show all of the operations recited. The Examiner stated that Kajiwara discloses forming at least one metal adhesion layer 10 on a surface of a die 2. The Examiner conceded that Kajiwara fails to show forming a diffusion layer on the adhesion layer or forming a solder-wettable layer on the diffusion layer, so the Examiner asserted that Lam teaches forming a diffusion layer 18 on a metal adhesion layer 16, and forming a solder-wettable layer 20 on the diffusion layer. It should be noted, however, that neither Kajiwara nor Lam disclose the operation of applying solder material to the solder-wettable layer. In Kajiwara, solder is applied only to metal layer 10, which the Examiner calls the “metal adhesion layer”. In Lam, no disclosure whatsoever could be found regarding applying solder material to any of the three layers 16, 18, and 20. Lam appears to employ an ultrasonic bonding tool 26 -- not solder -- to bond a lead 28 to upper layer 20.

Because the asserted combination of Kajiwara and Lam fails to teach or suggest all of the claim limitations present in independent claim 4, a *prima facie* case of obviousness has not been established.

Likewise, regarding independent claims 8 and 19, neither Kajiwara nor Lam disclose the operation of applying solder material to the solder-wettable layer.

For the above reasons, independent claims 4, 8, and 19 should be found to be allowable over any combination of Kajiwara and Lam, and Applicants respectfully request that the rejection of claims 4, 8, and 19 under 35 U.S.C. §103(a) as being unpatentable over Kajiwara in view of Lam should be withdrawn.

All of the claims that depend, directly or indirectly, from independent claims 4, 8, and 19, respectively, and incorporate all of the limitations therein, are also asserted to be allowable for the reasons presented above.

Rejection of Claims 25-27 and 29
Under 35 U.S.C. §103(a)
as Unpatentable over Wood in view of Lam

Claims 25-27 and 29 were rejected under 35 U.S.C. §103(a) as being unpatentable over Wood et al. (U.S. 6,107,122) in view of Lam.

To establish a *prima facie* case of obviousness under 35 U.S.C. §103, the prior art reference (or references when combined) must teach or suggest every limitation of the claim.

Regarding independent claim 25, as amended, no disclosure could be found in either Wood or Lam of forming an adhesion layer of metal on a back surface of a die, the back surface being formed of silicon, silicon oxide, or silicon nitride. In Wood, layer 42 (FIGS. 5B-5D) is formed on an aluminum electrode 36 (see col. 5, lines 22-23 and 60-61). In Lam, layer 16 (FIG. 9) is formed on an aluminum pad 10 (see col. 2, lines 67-68).

Because the asserted combination of Wood and Lam fails to teach or suggest all of the claim limitations present in independent claim 25, a *prima facie* case of obviousness has not been established.

For the above reasons, independent claim 25 should be found to be allowable over any combination of Wood and Lam, and Applicants respectfully request that the rejection of claim 25 under 35 U.S.C. §103(a) as being unpatentable over Wood in view of Lam should be withdrawn.

All of the claims that depend, directly or indirectly, from independent claim 25, respectively, and incorporate all of the limitations therein, are also asserted to be allowable for the reasons presented above.

Additional Elements and Limitations

Applicants consider additional elements and limitations of claims 4-27 and 29 to further distinguish over the cited references, and Applicants reserve the right to present arguments to this effect at a later date.

Conclusion

Applicants respectfully submit that claims 4-27 and 29 are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicants' attorney, Walter W. Nielsen (located in Phoenix, Arizona) at (602) 298-8920, or the below-signed attorney (located in Minneapolis, Minnesota) to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

BISWAJIT SUR ET AL.

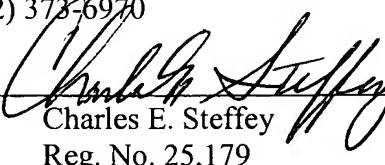
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Date

December 21, 2005

By


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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 21 day of December 2005.

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